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*The Great Sahara*  
*A Hot Desert*

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## **THE GREAT SAHARA A HOT DESERT**

**MARION WELLER**  
**Instructor of Geography**

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## THE GREAT SAHARA—A HOT DESERT

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## THE SAHARA

I. In the northern borderland of Africa, the Barbary states of Morocco, Algeria, Tunis and Tripoli, are found the gateways to the great desert lying on the south. The cities at these gateways, Fez, Algiers, Tripoli and Bangazi, are the points where regular caravan trails converge. For many hundreds of years caravans have been following these trails, winding their way slowly from the north to the Sudan belt on the south, or from the markets of the south northward. After the opening of the nineteenth century scientific interest in the great desert led European travelers and explorers to attempt the penetration of the desert. From the reports of those who were successful some knowledge is gained, and more recently the French have added much.

One can go to Egypt and in the City of Cairo—for there one is on the very edge of the desert—can hire an Arab dragoman who will furnish a whole caravan outfit, consisting of the necessary tents, camels, horses, donkeys, men, and provisions. With this preparation, a journey may be taken with perfect safety into the edge of the Lybian desert, to visit some of the ancient oases of Fayum with their irrigation systems dating back hundreds of years before Christ, and to get a little of the spirit and feeling of the desert, which always seems to have such fascination for one who is not desert born.

The tourist on a Mediterranean trip may stop at Algiers, travel by railroad to the oasis city of Biskra, some 200 miles inland, and here find himself in the border of the Algerian Sahara. Here he can be fitted out with the necessary equipment for a desert journey of a few days or a few weeks as he chooses. This can be done under the safe conduct of an Arab sheik as guide, who knows no other life and is a type of the Arab nomads who wander with their herds in the bordering steppes.

But such a journey will give the traveler only a taste of what this vast Sahara can furnish. It is a place of mystery and a great part of it will doubtless remain so for many years.

II. The City of Tripoli is the focus of three of the ancient caravan routes, which lead thru Ghadames, Ghat and Murzuk to the Sudan markets of Timbuktu, Kano, Jannem, Bornu and Wadai. It was for many years the most important gateway to the Sahara. But the Sudan began to find an outlet to the sea on the west, and caravan trade began to decline. The days of Tripoli caravan trade are numbered. The railroads which have been built thru the Mediterranean borderland and the telegraph lines which have already begun to penetrate the desert are only the forerunners of what is prophesied for the very near future.

It is in Tripoli that the traveler may come into touch with the caravan trade of the desert. Tripoli caravans outfitted by Tripoli merchants often travel from three to four thousand miles, sometimes taking two years for the round voyage. Many months of preparation are required. A leader, usually an Arab sheik, must be selected, one who not only has great courage and endurance, but who is trustworthy and shrewd. This

man's word is law on the trail, and it takes more than ordinary tact and skill to meet the emergencies which are bound to arise.

Thousands of camels must be purchased. As many as twelve or thirteen thousand of these lumbering jemals, or draft camels, are sometimes started out in one caravan. The camel market, stretching out across the sand outside the Tripoli oasis, appears as a "living, dun-colored sea of humps." The jemals bring from ten to thirty dollars a head, but the tall slender, riding camel, the *mehari*, brings as much as sixty dollars. Far back in the arid mountains and plateaus of the interior, the Arab and Berber tribes breed and raise large herds of camels, and the traveler on the trail will frequently pass them being driven to the northern marts, or to the interior stopping places, there to be sold to fill up the gaps in the trans-Saharan caravans.

Each camel must have a driver and will carry about 300 lbs. A great number of men must be employed. There must be horses and donkeys, goats and sheep; and food and water to take them to the first *fonduk* or stopping place.

The cargo may be valued at a million dollars. The merchants must stand all losses, so great care is exercised in the selection of both camels and men. Sometimes large profits are reaped, and again the entire cargo may be a total loss.

The dangers enroute are great. A sand storm may be encountered. Marauding desert tribes may attack. Wells may be missed or found dry. During the long march from one resting place to another scores of camels may die. Then the caravan must be halted, perhaps for a couple of months, for recuperation, and to secure fresh camels.

The caravan trail is not a well worn road. Often, for days it will be obliterated by the drifting sands, but the Arab seems to know it instinctively, and is guided by the stars, and landmarks known only to him. In long stretches it may be marked by the bones of animals and men that have dropped by the way. At times it will lead over endless sand dunes. Again it will follow a narrow defile which leads up to a rocky plateau or thru a mountainous country. It may follow stony river courses or *wadies*, and, in the season of rains, caravans are sometimes overtaken and destroyed by torrents which suddenly rush down from the mountains along the water courses.

In our own country, the old Santa Fé and Salt Lake trails, over which the "forty-niner" with his prairie schooner went to California in search of gold, crossed many miles of just such arid or desert plateau country. Those early pioneers endured hardships untold, and many lost their lives for lack of water, or were massacred by the wandering and bloodthirsty Indian tribes.

Mr. Furlong describes his experience with a *garfla*, or caravan, starting out from Tripoli for Murzuk, as follows:

"Groaning, grunting, wheezing and bubbling, the last camel of the caravan was loaded.....With my own Arabs I brought up the rear.....The make-up of this *garfla*, as is usual with those bound for the

interior, had required months of preparation, and was composed of many smaller ones, which had delayed their time of departure in order to take advantage of the protection afforded by numerical strength. In its heavy loads were packed the heterogeneous goods generally taken, consisting of cotton and wool, cloth, waste silk, yarn, box rings, beads, amber, paper, sugar, drugs, and tea, of which British cotton goods formed more than fifty per cent of the value. Besides these it carried some native products. Every autumn, caravans arrive from the interior and return with dried dates; for among the tribes of the Fezzan, Tripoli dates form the chief article of diet, and in the oases of the desert, dates chopped with straw are used as fodder.

"So one August night I found myself a part of a Saharan garfla, one of the vertebræ of a monster sand-snake, which wormed its way through the oases of Tripoli toward the Great Desert. I watched our garfla wind around or zigzag over the hills of sand, breaking and linking itself together again as it crawled its slow pace of three miles an hour. It marched in irregular order, characteristic of the Arabs, stringing out for miles, but closing in together for protection against attack as night approached."

"Through the most dangerous districts, the men were distributed the length of the caravan, with a strong rear guard—for it is from this point that an attack by an enemy is most feared. As the sun gets high, most of the men muffle themselves in their heavy woollen baracans (cloaks) to keep out the heat, and transfer their long flint-locks from across their shoulders to the packs of the animals. Between eleven and three o'clock occurs the midday rest. Tents are rarely if ever carried. Instead, the camels are unloaded and lie down; the men repose under a tent-like covering, using their baracans, propped up a few feet with a stick, war-club, or gun. Under these, in the suffocating heat their owners snatch the only rest of the day, for generally speaking, they travel twenty-one hours out of the twenty-four.

"We moved South. Passing caravans became scarce. A dust-cloud would appear in the distance, grow large, and a caravan of Bedouins, would pass by. Sometimes I would ride forward with my dragoman, anticipating a longer rest by reaching a fonduk several hours ahead of the slowly moving garfla. On one of these occasions, as we ascended a sand-hill the advance guard of a homeward-bound caravan suddenly loomed up before us. Eleven months before they had started from Kano, the first caravan to arrive from there for two years, owing to the general insecurity of the roads. Three months they had held over at Zinder and a month at both Air and Ghat. It took us all the afternoon to ride by the twelve hundred and twenty camels. They carried a thousand loads of Soudan skins, destined to find their way to New York for the manufacture of gloves and shoes; two hundred loads of ostrich feathers, and ten loads of ivory, besides rhinoceros horns, gum arabic and wax, valued altogether at over two hundred and five thousand dollars.

"Early one morning I had ridden some miles in advance. There was



great silence, and the moon neared the horizon. Suddenly my horse shied. Instinctively I searched the sky-line of hilltops. Had it not been for the black spot of a head, I might not have noticed the gray baracaned figure of a desert thief who, in his sleep, rolled out of his sandy lair. Startled, he sat bolt upright, and for a second stared blankly at me. He reached for his long gun which lay by his side, but I covered him with my revolver, and there he sat until out of range and sight. The fellow had been left by his comrades, who were probably in the vicinity. This trick of burrowing under the sand beside the course of an oncoming garfla is often resorted to. As the garfla passes, the thieves rise out of the earth, make a quick onslaught, and then rapidly retire, taking with them what booty they can lay their hands on, and frequently stampeding some of the camels."

The first stop of any length made by the garflas on their southward march is at Murzuk. Here a thorough rest is given to camels and men. Fresh supplies are obtained, the gaps in the ranks are filled out, and again the wearisome march is resumed.

III. 1. The Great Sahara is the largest of the hot deserts of the world. It is a part of the great trade-wind belt of deserts which stretches from the deserts of western India at the east to the Atlantic Ocean on the west, a distance of 7000 miles. The Sahara is the largest section of this belt. It is nearly as large as Europe, and larger than the United States, extending 3000 miles from the Nile valley to the Atlantic Ocean, and nearly 1000 miles from the Atlas Mts. and the low Mediterranean borderland on the north to the grass lands of the Sudan on the south.

The arid regions of the southwestern United States and Northern Mexico form a similar belt in North America, while in the southern hemisphere the trade-wind desert belt consists of widely separated areas the Chili-Peru desert in S. America, the Kalahari in S. Africa, and the great west Australian desert.

The Sahara is the type of the hot desert. In the desert, as in no other place, man is found yielding to the forces of nature, and adjusting himself to controlling conditions. This is seen in the clothing he wears, the food he eats, the shelter he makes, his nomadic life, and his modes of travel.

In the belt of cold or frozen desert of the extreme northern countries, in the tundras of N. America and Eurasia, and in Greenland, conditions are so hard, with the extreme cold and snow during a large part of the year and the consequent lack of vegetation, that life is one continual struggle for mere existence. Climatic control is absolute. In both cold and hot deserts, nature is man's enemy. In the cold desert the struggle is so great that he has yielded completely and so failed to develop either mentally or physically. In the hot desert, climate control is also perfect, but man has not submitted. In his adaption to conditions he has fought and grown strong in the struggle. The people of the frozen desert are stolid and passive and inoffensive. Those of the hot desert are quick, active and alert, enduring under hardships, and always ready to defend themselves.

2. The Sahara is a region of varied relief. It is a mistake to think of it as a dead level and one vast waste of endless sands. Sand there is in abundance, but there are rocky areas, high mountains, and tablelands; there are steppe regions with scanty vegetation; there are depressions, some of which are below sea level; and everywhere the country is scarred by old river courses or wadies which give evidence of vast erosion during earlier ages.

It is in fact a low dissected plateau or tableland, averaging about 1000 ft. above sea level. For 1000 miles along the western Mediterranean border it is shut off by the great Atlas range. Then for another thousand miles it almost meets the sea. It is separated from it only by a narrow strip of lowland from which the stony tableland rises in an escarpment which has been dissected into ravines and deep gorges and ragged terraced slopes.

About one-half consists of isolated flat-topped plateau blocks—*mesas*, they are called in the arid regions of Arizona and New Mexico—their sides, perpendicular ravined cliffs. The Hamada el Homra, the "red wilderness," is such a rocky plateau, barring the road from Tripoli to Fezzan. It is a solid plateau of chalk, rising to an elevation of 1800 ft. above sea level, hundreds of miles long east and west, and 140 miles broad where the trail crosses. The surface is of solid rock, covered everywhere with small red stones and bits of chalk. It is a five days march for a caravan crossing it.

The other half consists of greatly dissected mountain highlands; sand dune areas, or ergs; steppe lands; depressions once occupied by lakes now dry and encrusted with salt, and old river channels. It is estimated that only about one-ninth is covered with sand.

The highest elevations form a belt extending in a northwest-southeast direction thru the center of the Sahara plateau, dividing it into the eastern, or Lybian, desert and the western, or Gidi, desert. This highland belt does not reach the elevation of the chief European ranges or the Cordilleran ranges of North America, but is more than a rival of the Appalachian highland. In the northwest its summits reach an elevation of 5000 feet and from here it extends for 1000 miles to the Tibesti Mountains with summits of 9000 ft. Smaller highland groups west of the Tibesti, are the Air, or Asben, plateau and the Ahaggar mountains.

The water courses or wadies are numerous. The width and length of many of them indicate that they were once the beds of large rivers, but now very few of them have any permanent water supply. Those which drain the southern slope of the Atlas Mountains carry water to the oases at their base, but those which head back into the interior highlands carry water only after the local rains in the mountains, and then torrential streams come down these wadies bringing with them quantities of sediment to be spread out on the plains. The water soon sinks beneath the surface, often traveling immense distances underground, and comes to light again as springs and so brings fertility to isolated spots.

There are in the western and northern desert areas of relative de-

pression, inland basins in which the wadies from the plateau lose themselves. Such depressions are also found near the borders of the highest land. The depression south of Tibesti receives the overflow waters of L. Chad in the rainy season. Some of these areas may have been at one time beds of fresh water lakes with outlets to the sea. In and along their borders as well as along the dry river courses are located regular belts of oases.

In the border of the Algerian Sahara is a system of *shotts*, or depressions, which form a chain of salt marshes, or shallow lagoons. All except the Jerid are below the sea level and may in earlier geological time have formed a western extension of the Gulf of Gabes. The shott Melghir is the most western of the chain and is the outlet of the Wady Igharghar, which has its origin in the Ahaggar plateau, 750 miles to the south. The Igharghar is the chief artery of what was once a great river system draining a large part of the northern Sahara. Its channel in places expands to a width of four and six miles, and although in some places the bed is almost effaced with sand it is still followed by the native caravans.

In the great arid plateau-belt of the United States, lying between the Rockies and the Sierra Nevadas, once called the great American Desert, may be seen all of these relief and drainage features characteristic of the Great Desert of Africa. Like the Sahara its relief is varied. In Utah and Nevada the surface is broken by the Basin Ranges. Farther south the *mesa* type of topography prevails. In places are great depressions such as the Death Valley nearly 300 feet below sea level, which receives the scanty waters of the Amargosa river. This valley, like similar places in the Sahara, furnishes large quantities of salt, borax and other minerals, deposited from the water which once occupied it.

There are thousands of square miles of alkali plains, the beds of ancient lakes which once had outlets to the sea, as did Lake Bonneville of which the Great Salt Lake is the remnant. Many water courses may be seen, either dry or containing water intermittently, and ending in sinks or salt lakes, like the Humbolt and Sevier rivers. Such a dry water course is called by the Mexican name, *arroyo*.

Notwithstanding the great variety in relief, the Sahara gives one the impression of monotony and endless sameness. This is due to the almost complete absence of water and vegetation thru long stretches on the traveled routes.

3. The desert is caused simply by the absence of rain. This is explained by the prevailing dry winds. In the Northern summer the equatorial heat equator reaches its northern limit in the Sudan, and the Northeast trade winds move toward it from across the Sahara. These winds come over the Sahara not from a great ocean, but from the land mass of Eurasia, consequently they are not moisture laden. Whatever moisture is collected from the Mediterranean is lost in the Atlas Mountains or in the rising to the plateau or is retained from the fact that the air is moving toward a hotter belt and does not pass over elevations great enough to cause it to give up its moisture. In the northwest-southeast highland belt there is some rainfall however.



The prevailing winds are therefore drying winds. They are frequently interrupted by local winds which cause violent sand storms and are a terror to man and beast. The sirocco is such a wind. These storms may last for only a few hours, but sometimes extend thru days.

When a sand-storm is approaching, signs of its coming are seen in the restlessness and peculiar cries of the camels, and they are immediately collected and hobbled and preparations are made for the sand siege. "High in the air great flames of sand reach out; the lurid sand-cloud, completely covering the sky, comes down upon the caravan. In the deep yellow gloom the garfla, back to the storm, lies huddled together; the men, wrapped up completely in their baracans, on the leeward side of the camels, hug close to the goatskins of water. The whole air is surcharged with suffocating heat and fine powdered sand-dust, which finds its way even as far as Malta and Sicily. During the storm the men lie thus, occasionally digging themselves to the surface as they become partially covered with sand. Frequently all the water dries up. At such times camels are often sacrificed for the sake of the greenish water which may be obtained from the honeycomb cells of the reticulum, a mature camel yielding about five or six quarts; and, strange as it may seem, the water is cooler than that carried in goat skins. The storm over, a surviving garfla of emaciated men and animals staggers on to the nearest oasis or town, over plains which before were sand-hills, and sand-hills which now are plains."

The average rainfall is not much more than five inches. There are large areas in the Sahara where years will intervene between showers, but in more elevated plateaus and the bordering steppe lands there is enough rain to make grazing possible. After the rains in the spring the country seems to burst forth in a wealth of flora, but this is very brief. There is strong evidence however of a former abundant rainfall in the extensive systems of old river valleys with their dry and deserted water courses.

The great extremes of temperature recorded by travelers between day and night seem almost incredible. Under the nearly direct rays of the blazing sun the mercury rises to 150 or even 170° F., while at night it will fall to two or three degrees below the freezing point. In the winter the wind blows cold and penetrating over the high table lands, and here snow has been known to fall.

The sandy areas are not, as was formerly supposed, beds of ancient seas, but the sand has been produced by the weathering of the rocks, as have the rough rocky surfaces of the plateaus. The enormous variation of temperature between day and night splits up the rock surfaces in every direction and the sand is carried away by the wind, and as far as the eye can see it stretches away in great billowy dunes.

Some slight notion of what the sand dunes are like may be obtained by making a visit to the sand-dune district about the south and east border of Lake Michigan. Here the sand is washed up on the shore by the water and then carried by the wind and piled into great hills which have moved



inland and buried large forest areas in their path. These dunes are not more than 80 ft. high, while in the Sahara they reach an elevation of hundreds of feet. Not long ago a typical desert scene was observed out at Dune Park on the Lake Michigan shore. Camels had been taken to the dune district with people dressed in Arab costumes, and moving pictures were being taken of the group. There are extensive sand-dune areas in our western arid country and along coasts where the ocean waves wash up the sand and leave it exposed to the wind. Dunes may be seen on Cape Cod and the barrier islands along the Jersey and Carolina shores.

4. The plant life of the desert is controlled by the absence or presence of water. Certain plants, such as the prickly acacias, thorny plants and coarse grasses, which can protect themselves against the drought, may be seen in scattered tufts, but the soil is not naturally infertile, and wherever water is available vegetation is abundant. The fertile spots or oases are scattered thru the whole length and breadth of the desert. Here grow the grains, rice and millet, but the most valuable product is the date palm. The size of an oasis may vary from a few date palms gathered about a natural spring, to areas many miles in extent over which are scattered hundreds of thousands of palm trees and many villages.

The date palm is a stately tree, growing to a height of from fifty to eighty feet, and bearing fruit in bunches which weigh from 10 to 40 pounds. They are planted in no apparent order; in some gardens they are so close that their stems almost touch; in others fig, olive and apricot trees are planted under their shade and in the spaces between are small patches of vegetables, or grain, while grapevines are festooned from trunk to trunk and here and there oranges and pomegranates fill up the spaces. After the blinding glare of the desert without, the cool shade of the dense forest of palms is delightful. The date gardens require unremitting toil. It is necessary to dig around the roots of the trees, to dig wells, prepare irrigation canals, and fight against the encroaching sand. The flowers must be fertilized, and this requires skill. When the harvest time comes, the fruit must be gathered, handled and packed with great care. The people of the oases live in their walled villages, going out each morning to the gardens. Only during the ripening season, when the fruit must be guarded against thieves, do the gardeners camp among the trees and on the walls which divide the holdings.

The so-called oasis of Tifilet, south of the Atlas Mountains, is not a single oasis, but is made up of a number of separate oases, with some 300 walled and fortified villages. The Tuat oasis is in a central position between the northern marts and Timbuktu, and is an important meeting and trading center. It is in the basin of the Wad Saura, and is composed of some 300 or 400 petty states, extending over an area 200 by 180 miles. The Kewar oasis is the most important to the traveler on the route from Tripoli to Lake Chad. It lies in a depression about 50 miles long, and is said to be one of the hottest districts in the world, but the underground reservoir yields abundant water for the date groves and for passing caravans.

The oases of the Jerid are perhaps the most accessible, and the best known of the date gardens of the Northern Sahara. There are some 6000 acres in each oasis, with nearly one million date trees all told. Each oasis is a dense forest, with many individual holdings. The gardens occupy a gentle slope at the base of an escarpment which forms the northern border of the desert. South of the slope lies a broad, shallow pond, encrusted with salt, one of the chain of depressions stretching west from the Gulf of Gabes. From the base of the bluff, or escarpment, there gush forth numerous springs which furnish the oases with a constant and abundant supply of water for irrigation.

Always along the sandy beds of the old river courses, water may be found. The water which falls as rain in the highlands, after following the wadies for short distances very quickly disappears in the sand and gravel and follows underground courses. There seems to be an almost inexhaustible supply from these underground reservoirs. Not only along the river courses, but throughout the sand-dune areas and in the plateaus, water may be obtained by digging or boring for it. In some places the underground water is so near the surface that the roots of the palm trees reach down to it, and in other places the palm trees are set out in the sand and the water from wells is taken to them. The methods of irrigation are very primitive. But since the French occupation of the Algerian Sahara, thousands of artesian wells have been located by the French engineers, and better methods of irrigation are being introduced.

The land in the oasis is held in common by the people in a village. A man does not own the land upon which his trees grow or in which his well is dug, but his riches are counted by the number of trees he owns and the number of wells he controls, as among the nomadic tribes a man's wealth is measured by the number of his camels.

The animal life of the Sahara is even poorer than the plant life. The lion and some other animals are found in the mountains and high plateaus, and some members of the antelope family are seen in the steppes, and reptiles in the oases. The camel is of course the most important of domestic animals. Some Berber tribes, which raise large herds of them, depend upon them for milk and sometimes meat, and use the hair for cloth and tent canvas, and the skin for leather. It was brought to the Sahara by the invading Arabs and has become the only means of travel in the desert.

5. The native peoples of northern Africa are the Berbers, the Arabs and the Blacks. The Berbers are descendants of the Semitic tribes who, coming from the east, overran the country and settled in the mountains and plateaus centuries ago. Then in the seventh century the Arab invaders swept over the country in hordes. Until this time, the desert had been a complete barrier, separating the northern people from the blacks of the Sudan. But to the Arab the desert had no terrors. With him came the camel, and before the year 1000 a regular caravan traffic had been established across the desert. The slave trade brought thousands of blacks into the desert and left a large negro element among the settled people of the north.

The people of the Sahara today may be divided into nomads and sedentaries, the larger number being nomadic. In the north and west the Arab nomads, the Bedouins, wander from place to place with their flocks and herds, living in tents and going wherever grass may be found when the rains come, and camping near the oases where they can get supplies in the winter months.

The Arab is usually credited with the control of the desert, but the real rulers are the Tuaregs, those mysterious people whose homes are in the very heart of the plateaus and the mountains. They are cunning and fierce; relentless in their tribal feuds; are seldom seen, although occasionally they appear in the northern markets, coming as convoyers of caravans from the south, or for trade, or perhaps, to spy upon caravans which are being outfitted. It is claimed by some that they are to be trusted when a promise has been given and are loyal in defense of a guest, but this has not been borne out in some of their dealings with people crossing their territory. Their religion is Mohammedanism, taken from the Arab invaders. The women are honored, can usually read and write, and teach their children. They do not cover the face as do the Arab women, but on the other hand the men never go unveiled. This covering is supposed to have been used originally as a protection against the sand and dust of the desert, but has come to have a religious significance. The men are tall with lean supple figures, and, although of the white race, have the swarthy faces of those who have been exposed thru generations to the heat and wind and sand of the desert—children of the desert, inured to every hardship. "The dagger is the Tuareg's main weapon, and has two unique characteristics. Attached to its scabbard is a broad, leather ring thru which are passed the left hand and wrist; the knife lies flat against the inner side of the arm, its handle grasped by the hand, for the Tuareg evidently goes on the principle that a 'knife in the hand is worth two in the belt.'" The handle is in the shape of a cross and this symbol is found in the handle of the two-edged sword and in ornaments.

The wanderers in the heart of the desert are of Berber descent. The fierce Tuareg tribes, sometimes called the buccaneers of the desert, are found in the central and western part, while East of the Tibesti highland are the Tibbus. The Tuaregs live by preying upon the sedentary people of the oases, and travelers. They exact large tribute from the caravans, and in turn offer them safe conduct. This does not always mean security, for there are other bands ready to fall upon them, and sometimes a whole caravan will be confiscated, in spite of the protection given them. In the very center of the desert, in the Ahaggar Mountains, the fiercest of them dwell, and from here in all directions they are "masters of a territory half as large as the United States, in which the cultivated land would cover an area no larger than New York City." Every south bound caravan from Tripoli must pass thru their territory, and woe unto the caravan if a band of these marauders, mounted on swift camels or fleet-footed horses, should appear in an unguarded moment.

The sedentaries are the people who have permanent dwelling places.



They live in walled villages adjoining the oases or on rocky eminences near by, as did the Pueblo Indians of the southwest. The inhabitants of the towns of the coast countries are called Moors. They are Arabs, with a mixture of Berber stock, who have abandoned the nomadic life and settled down to a life of trade. The people on the oases have settled down to a life of agriculture. They are a mixture of the races, strongly Berber, and some entirely black. Many Berber tribes live in villages in the mountains and edges of the plateau, where they were driven by the invading Arabs. Some are called rock dwellers, because they make their homes in caves and holes in the ground. Such are the Troglodytes of southern Tunisia. Some of them live as did the cave-dwellers of prehistoric times in our own western country.

IV. A section of the desert, bordering on Egypt, is in the British sphere of influence, but the greater portion is French territory.

Since 1880, the French occupation and conquest of the western and central portion of the Sahara has brought about a transformation of conditions throughout the territory. The failure of the earlier expeditions, largely through outrages committed by Tuaregs, proved to the leaders that they must abandon the idea of moving slowly with a heavy caravan, and adopt the methods of the desert brigands. It was decided therefore to undertake the organization of troops composed of natives under the command of French officers, and mounted on swift *meharis*. These troops are on an equality with the Tuaregs, in speed and mobility, and their superiority in arms assures to them victory. They have adopted an offensive in place of a defensive attitude toward the native tribes, and the Tuaregs, finding that they are followed up and punished for every act of vandalism, have finally submitted.

"The *mehari* can bear beside his rider and his arms, food for 30 days, and two skins of water. With this load he can march from 3 to 3 1/4 miles an hour and amble at a pace of 5 miles. The desert plants suffice for food and in summer he can endure 5 days without drinking while, when plants are green, he can go without water for 18 or 20 days. So by borrowing from the inhabitants of the desert their mode of life and locomotion, the French have triumphed over the obstacles which the nature of the soil and of the inhabitants had set against the exploration of northern Africa."

In the same way in early days the British soldiers learned that the Indians could not be conquered by methods of warfare learned in England. And, more recently, Arctic explorers found that success came only by adopting the means of locomotion and existence of the Polar people.

Beside the subjugation of the native tribes, much has been accomplished by the French in traversing and exploring and charting vast unknown regions, and in establishing in the oases troops for police duty. They have investigated the commercial possibilities of immense territories and made reports on the soil, climate, and the existence of forestal and mineral wealth. Their reports on the native peoples, are valuable because on them must depend finally the commercial development of the



country. Modern irrigation methods are being introduced in the oases. A railroad has been surveyed from Biskra to Lake Chad. The central desert routes are now safe, and filled with long trains of heavily laden draft camels carrying annually 25000 loads of salt and 5000 of dates.

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